

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		<p>المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة</p>
---	--	--

CE 641 Advanced Transportation Systems Analysis

College: Engineering

Department: Civil

First: Course Definition

1- Course Code : CE 641

2- Units : 3

3 – Semester

4 -Prerequisite

5- Co-requisite

6- Location (if not on main Campus):

Second: Course Objectives

1- Apply systems analysis in transportation planning and engineering, including supply, demand, equilibrium, evaluation, and decision analysis.

Third: Course Specifications

1- Topics to be covered

Subject	No of Weeks	Units
Modeling Transportation Systems	1	3
Transportation Supply Models Traffic Flow Theory, Congested Network Models Applications of Transportation Supply Models	3	9
Random Utility Theory Basic Assumptions, Some Random Utility Models Expected Maximum Perceived Utility, Choice Set Modeling Direct and Cross-elasticities of Random Utility Models Derivation of Logit Models from the GEV Model	3	9
Travel-Demand Models Trip-based Demand Model Systems, Examples of Trip-based Demand Models, Trip-Chaining Demand Models, Activity-	3	9

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		<p>المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة</p>
--	--	--

Based Demand Models, Applications of Demand Models		
Basic Static Assignment to Transportation Networks Definitions, Assumptions, and Basic Equations, Uncongested Networks, Congested Networks: Equilibrium Assignment, Result Interpretation and Parameter Calibration	2	6
Transportation Supply Design Models	1	3
Methods for the Evaluation and Comparison of Transportation System Projects	1	3

2- Course components (Total hrs in the Semester): 42

Lecture	Exercise	Other
42	-	0

3- Intended Learning Outcomes of the Course (ILO's)

a. Knowledge

i) Description of the knowledge to be acquired:

- Traffic Flow Theory
- Congested Network Models
- Applications of Transportation Supply Models
- Travel-Demand Models
- Transportation Networks : Equilibrium Assignment
- Transportation Supply Design Models

ii) Teaching strategies to be used to develop that knowledge

- Class lectures.
- Term projects.
- Students' presentations.
- Group discussion.

iii) Methods of assessment of knowledge acquired

- Exams.
- Quizzes.
- Homework assignments.
- Term projects.

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة
---	--	--

b- Cognitive (Intellectual) Skills

i) Cognitive skills to be developed

- Advanced concept of transportation system analysis
- Evaluation and Comparison of Transportation System Projects

ii) Teaching strategies to be used to develop these cognitive skills

- Class lectures.
- Case studies analysis.
- Term projects.

iii) Methods of assessment of students cognitive skills

- Students' seminars and presentations.
- Term projects.
- Written reports.

c. Interpersonal Skills and Responsibility

i) Description of the interpersonal skills and capacity to carry responsibility to be developed

- Decision making based on engineering analysis.
- Communication skills.
- Team work.

ii) Teaching strategies to be used to develop these skills

- Class lectures.
- Term projects.
- Case studies analysis.

iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility

- Term project.
- Written reports.
- Students' seminars and presentations.

d. Communication, Information Technology and Numerical Skills

i) Description of the skills to be developed in this domain

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة
---	--	--

- Literature research.
- Problems modeling.
- Utilization of computer applications in analysis and modeling.

- ii) Teaching strategies to be used to develop these skills**
- Class lectures.
 - Case studies analysis.
 - Computer lab sessions.
 - Term projects.
- iii) Methods of assessment of students numerical and communication skills**
- Term projects.
 - Written reports.
 - Students' seminars and presentations.

e. Psychomotor (if applicable) & Other Non-cognitive Skills

- i) Description of the psychomotor or other skills to be developed and the level of performance required**
- NA

- ii) Teaching strategies to be used to develop these skills-**
- NA
 -

- iii) Methods of assessment of student's psychomotor skills**
- NA

4- Student Assessment Schedule

<i>Serial</i>	<i>Assessment tool (test, group project, examination etc.)</i>	<i>Week due</i>	<i>Weight</i>
1	Term Project – 1	3 rd	15 %
2	Mid Term Exam -1	7 th	15 %
3	Term Project – 2	10 th	15 %
4	Term Project – 3	13 th	15 %

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة
---	--	--

5	Final Exam	16 th	40 %
---	------------	------------------	------

5- Student Support

- Providing electronic library of textbooks and scientific periodicals.
- Providing the necessary computer applications for the course.

6- Learning Resources

- i) Essential Books (References)**
- Cascetta, E. " Transportation Systems Analysis: Models and Applications (Springer Optimization and Its Applications)," Springer; 2nd edition, 2009. ISBN-10: 0387758569, ISBN-13: 978-0387758565

- ii) Course Notes**
- NA
 -

- iii) Recommended Books**
-

- iv) Electronic Books & Web Sites:**
- Scientific journals and forums.
 -
 -

- v) Periodicals**
- ASCE scientific journals.
 - ScienceDirect journal.

<p>Kingdom of Saudi Arabia Ministry of Higher Education Qassim University College of Engineering</p>		<p>المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة</p>
---	--	--

7- Course Evaluation and Improvement Processes

i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- Students' questioners.
- Students' evaluation of course and instructor.

ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- Public faculty seminars.
- Assessment by external evaluators of students achievements
- -Instructor (Course) Report

iii) Processes for Improvement of Teaching

- Assessment of students' work by external examiners.
- Analysis of students' evaluation of course and instructor.
- Seminars by industry professionals.

iv) Processes for verifying standards of student achievement (e.g. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)

- Check marking by an independent faculty member of a sample of student work.
- Periodic exchange and remarking of a sample of assignments/exams with a external evaluator.

v) Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- Assessment and evaluation of the level of achieving the course outcomes through a continuous improvement process (part of a quality assurance system established by the university),
- Consequently, actions are to be taken to improve the course delivery when necessary.
- Review of the course objectives, outcomes and curriculum every 2 years.